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A SPRAYER FOR APPLYING INSECTICIDES TO SMALL PLOTS

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A sprayer for applying insecticides to replicated plots was developed for use in research on chemical control of small-grain insects and mites. With it emulsion sprays can be applied more quickly and uniformly than with small compressed-air tank sprayers, and application rates may be calculated readily. This machine is easily cleaned. It can be pulled by hand, with a tractor, or with an automobile, and can be carried to any desired location in a pickup truck or a small trailer. The approximate cost of the materials is \$175.

The sprayer (fig. 1) is carried on a two-wheel cart which consists of a wooden platform bolted to a frame 42 inches square constructed of 1 1/4-inch galvanized-iron pipe welded at the joints, heavy-duty motor-bicycle wheels and tires, and a tongue with an adjustable trailer hitch. Two heavy-duty motor-bicycle wheel forks are used to attach each wheel to the frame. The wheels are approximately 42 inches apart.

The spraying unit consists of a 3/4-inch gear pump powered by a 1-horsepower gasoline engine, a pressure regulator, a pressure gage, a boom shutoff valve, and a 3-gallon tank 6 3/4 inches in diameter and 24 inches tall. In the tank cover are two holes for accommodating the suction and bypass hoses connected to the pump. Splashing of insecticide through the holes is minimized by two 6-inch tubes soldered on the inside of the cover (fig. 2). The spray boom consists of a 6-foot center section with two 3-foot wing extensions, and is equipped with standard nozzles (fig. 3). The nozzle arrangement sprays a swath of 12 feet. Adequate agitation in the tank is obtained by the bypass flow of liquid from the pump.

^{1/} In cooperation with the Texas Agricultural Experiment Station. The suggestions offered by J. C. Gaines, Station entomologist, for the construction of this sprayer are gratefully acknowledged.

When the sprayer is pulled behind an automobile, an angle-iron drawbar fitted with a ball is attached to the two trailer-bumper clamps (fig. 3), and when a tractor is used the ball is fitted to the tractor drawbar.

For transportation to distant locations in a light one-wheel trailer (fig. 4), the sprayer is held securely in place by two turnbuckle tie rods on each side. The boom-wing extensions are folded forward for clearance.

A number of small spray tanks can be made available so that a separate one can be used for each material applied. This procedure saves the time required to wash the tank between applications, and reduces the chances of contamination. One tank of water should be ready for flushing the spray system between treatments.

The amount of spray applied is calculated by subtracting the quantity left in the tank from the original amount. The sprayer output at a given speed may also be calculated by measuring the amount of liquid sprayed into a jar by a single nozzle and relating it to the number of nozzles. Adjustment of speed or pump pressure is then made to obtain the desired rate of application.

Although this sprayer has been developed for treating small grains, it may easily be adapted to row crops by installing drops. It can be used for spraying larger areas by substituting a larger tank, or by mounting a barrel on a pickup truck or tractor used to pull the sprayer.

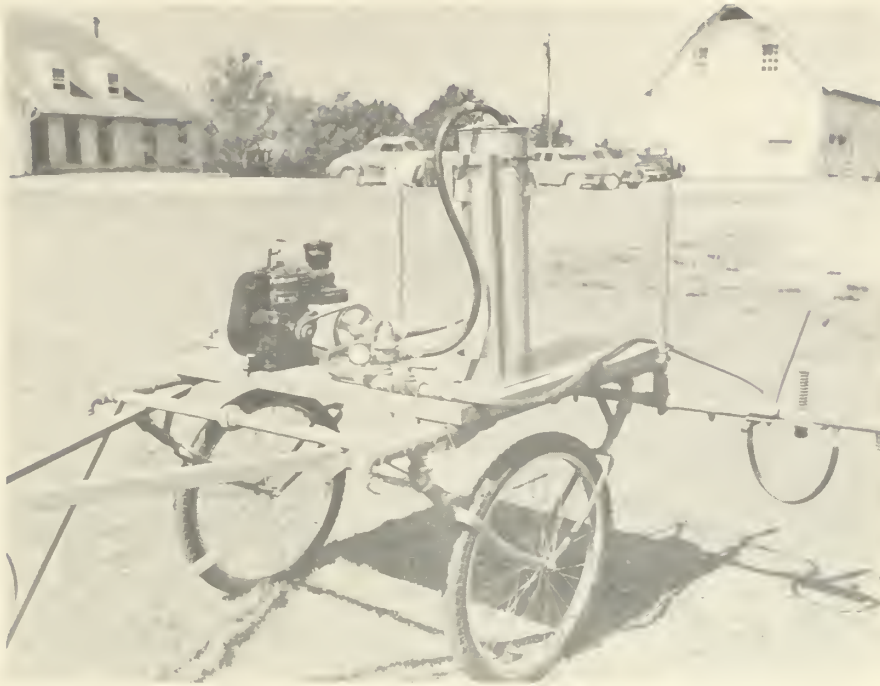


Figure 1.--Sprayer for applying insecticides to small plots.



Figure 2.--Spray-tank cover, showing short tubes on inside to prevent spray from splashing out of tank.

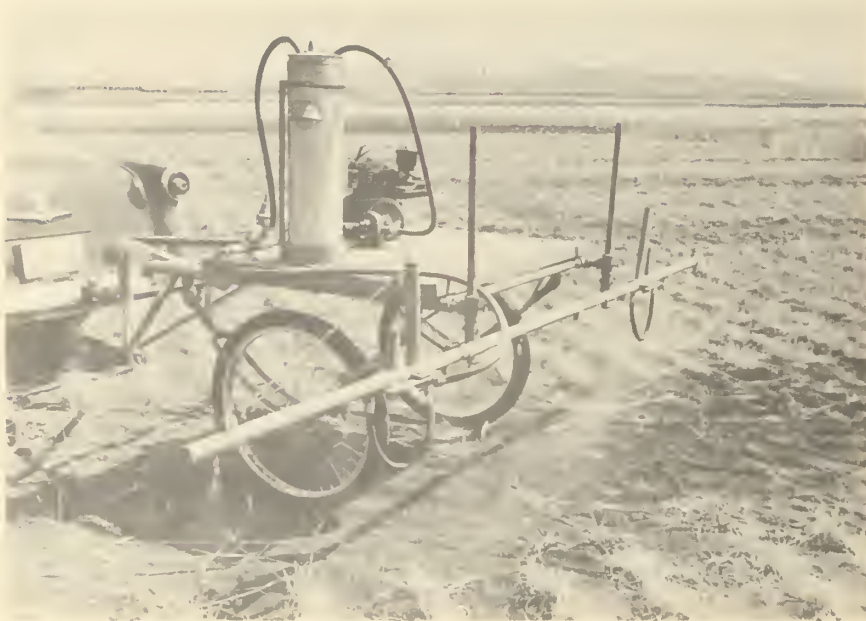


Figure 3.--Sprayer showing adjustable hitch of cart to automobile bumper, and boom arrangement. Boom is adjustable up or down by loosening set screws holding it to frame.

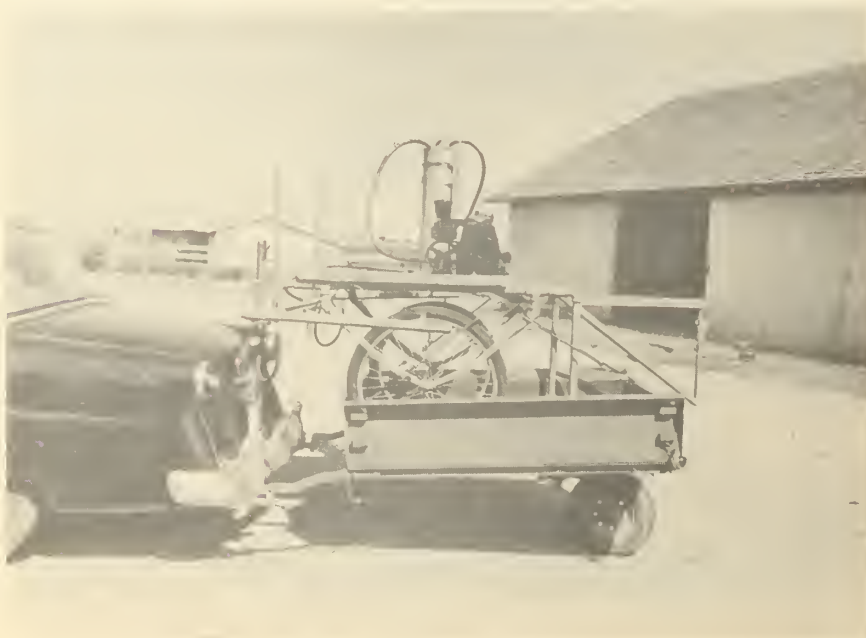


Figure 4.--Sprayer loaded in small trailer.